

BOSTON TRANSPORTATION DEPARTMENT VIDEO MONITORING SYSTEM SPECIFICATIONS

May 23, 2005

General

This specification set forth the minimum requirements for a VM system that monitors vehicles on a roadway via a traffic monitoring camera system with remote viewing capability.

The system shall consist of a pendant dome mounted traffic monitoring camera with remotely controlled pan/tilt/zoom, and supervisor computer software and digitizer/remote receiver.

Communications with the supervisor at Boston City Hall shall be via direct fiber or copper communications, a telephone dial-up, or an ISDN line as directed by the BTD Engineer. The contractor shall install line boosters if needed in order to provide reliable communications between the proposed field location and the supervisor computer. Camera control protocols shall be compatible with the existing switching hardware/software and other control equipment at the Boston Traffic Control Center. Video image via direct copper shall be provided at a minimum of 5 frames per second unless otherwise approved by the BTD Engineer. Video images via fiber shall be visible simultaneously and provided at a minimum rate of 30 frames per second.

Environmental

The VM field equipment shall be designed to operate reliably in the adverse environment found in the typical roadside traffic cabinet. It shall meet the environmental requirements set forth by the NEMA (National Electrical Manufacturers Association), TS1 and TS2 standards. Operating temperature shall be from -35 to +74 degrees C at 0% to 95% relative humidity, non-condensing.

Electrical/Mounting

The cabinet equipment shall be plug connected and shelf mounted.

The VM shall be equipped with a video input to allow connection of the local traffic monitoring camera. A BNC connector shall be provided for this input.

Image Sensor and pan/tilt system for Traffic Monitoring

A color CCD camera with 1/4 inch image format and a remotely controlled pan/tilt mechanism and electric zoom shall be provided to generate images for traffic monitoring.

The camera and ancillary control/interface electronics shall provide images which shall be viewable at the VM's remote supervisor computer. Automatic/manual iris and AGC

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on/off shall be remotely selectable at the supervisor computer or video switch as directed by the BTB Engineer.

Image Sensor Enclosures

The image sensor and lens assembly shall be housed in an environmental enclosure that provides the following capabilities:

- a.** The enclosure shall be waterproof and dust-tight to NEMA-4 specifications, and shall be pressurized with an inert gas to 5+-1psi.
- b.** The enclosed shall allow the image sensor to operate satisfactorily over an ambient temperature range from -34 degrees C to +60 degrees C while exposed to precipitation as well as direct sunlight.
- c.** The enclosure shall allow the image sensor horizon to be rotated in the field during installation.
- d.** The enclosure shall include a provision at the rear of the enclosure for connection of power and video signal cables fabricated at the factory. Input power to the environmental enclosure shall be 115 VAC 60 Hertz, with 240 VAC 50 Hertz as an option.
- e.** A heater shall be at the front of the enclosure to prevent formation of ice and condensation in cold weather, as well as to assure proper operation of the lens' iris mechanism. The heater shall not interfere with the operation of the image sensor electronics, and it shall not cause interference with the video signal.
- f.** The enclosure shall be light-colored and shall include a sun shield to minimize solar heating. The front edge of the sun shield shall protrude beyond the front edge of the environmental enclosure and shall include provision to divert water flow to the sides of the sun shield. The amount of overhang of the sun shield shall be adjustable to prevent direct sunlight from entering the lens.
- g.** The total weight of the image sensor in the environmental enclosure with sunshield shall be less than 2.3 kg or five (5) pounds.
- h.** When operating in the environmental enclosure with power and video signal cables connected, the image sensor shall meet FCC class B requirements for electromagnetic interference emissions.

The video output of the image sensor shall be isolated from earth ground. All video connections from the image sensor to the video interface panel shall also be isolated from earth ground. The video output stage of the image sensor shall include transient protection to prevent damage to the image sensor due to voltage transients occurring on the coaxial cable leading from the image sensor to the VMS.

Connections for both video and power shall be made to the image sensor using a single 18 pin circular metal shell connector (Bendix PT07C-14-18p or equivalent). The mating cable shall use a right angle shell and shall be available in lengths of 5, 10, 30, 60 feet etc. to accommodate various installations.

A galvanized steel junction box shall be used to make connections between the image sensor and VMS. This junction box shall be installed on the structure used for image sensor mounting. The junction box shall contain a terminal block for terminating power to the image sensor and connection points for coaxial cables from the image sensor and from the VMS.

A video interface panel shall be provided within the traffic cabinet. The panel shall provide coaxial cable and image sensor AC power connection points. An Edco CX06-BNCY or approved equal transient suppressor shall be included for each image sensor. The shield side of the coaxial cable connection at the transient suppressor shall be connected to earth ground via the transient suppressor. The image sensor AC power shall be connected to the transient protected side of the AC power distribution system in the traffic control cabinet in which the VMS is installed.

A video isolation amplifier shall be included as part of the video interface panel. The isolation amplifier shall buffer the video signal and provide transient suppression. The isolation amplifier shall have a minimum common mode rejection ratio of 60Hz of 100 dB.

The image sensor shall be connected to the VMS such that the video signal originating from the image sensor is not attenuated more than three (3) dB when measured at the VMS cabinet interface. The connection between the image sensor and the VMS shall be coaxial cable. The coaxial cable used shall be a low loss 75 ohm precision video cable suited for outdoor installation, such as Belden 8281, West Penn P806, or approved equal.

The contractor shall furnish and install the hardware and software so as to provide a fully functioning video controlling real time traffic monitoring from the remote monitoring camera. The installed software and hardware shall be designed so as to not interfere with existing video system. The contractor shall make all connections necessary to provide video and PTZ control at the Boston City Hall Traffic Control Center.

Submittals

All proposed equipment shall be submitted to the BTB Engineer for approval.

Documentation

Wiring diagrams and manuals shall be supplied for all equipment installed as part of the VM System. Documentation shall involve instructions for set up and troubleshooting of all components in the Video Monitoring System.

Installation and Training

The supplier of the video monitoring system shall supervise the installation and testing of the system and control computer equipment. A factory certified representative from the supplier shall be on site during installation. Two days of training shall be provided in the operation, setup, and maintenance of the video detection system. Instruction and materials shall be provided for a maximum of 20 persons and shall be conducted at a time and location selected by BTB. The contractor shall submit proposed material to be covered for approval by the BTB Engineer.

Warranty, Maintenance and Support

The video monitoring system shall be warranted by its supplier for two (2) years from the date of delivery.

The supplier shall maintain a program for technical support and software following expiration of the warranty period.